

4pnts

1

10/537236

5617 Rec'd PCT/PTO 31 MAY 2005

A SYSTEM AND A METHOD FOR SELECTING IN A TERMINAL AN
ARCHITECTURE DEDICATED TO A COMMUNICATIONS NETWORK

5 The present invention relates to a system and to a
method for selecting in a terminal an architecture that
is dedicated to a communications network.

10 The invention applies more particularly to using a
dedicated architecture integrated in a terminal connected
to a public mobile network to which the user is a
subscriber, for accessing a communications network from a
set of communications networks, each offering a set of
services.

15 At present, such services are accessible from a
terminal connected to mobile telecommunications networks
such as GPRS (General Packet Radio Service) networks and
UMTS (Universal Mobile Telecommunication System)
networks.

20 In these mobile networks, to select a communications
network offering services, it is necessary to select a
name identifying the communications network. To set up a
connection between a terminal and a particular
communications network, the identifying name is
transmitted via a service support equipment of the mobile
network to an equipment managing access to the
communications networks. The identifying name specified
25 by the terminal enables the service support equipment of
the mobile network to determine the access management
equipment associated with the identifying name that
offers access to the specified communications network.

30 In existing GPRS and UMTS networks, the name
identifying a communications network is called its access
point name (APN), the service support equipment is called
the serving GPRS support node (SGSN), and the equipment
managing access to the various communications networks is
called the gateway GPRS service node (GGSN).

35 An APN primarily comprises an identifier that
corresponds to the selected communications network, an
identifier of the operator managing the communications

network, and an identifier of the technology of the mobile network, for example the GPRS technology. The format and use of an APN are covered by standards issued by the ETSI (European Telecommunications Standards
5 Institute).

One function of an SGSN is to receive an APN from a terminal and to send it to an APN server to which it is connected in order for the APN to be recognized. The APN server responds to the SGSN by sending a list of the GGSN
10 associated with the specified APN. One function of the SGSN is to set up a connection to a GGSN from the list. The GGSN sets up a connection to a communications network that corresponds to the APN. The SGSN and the GGSN are also covered by ETSI standards.

15 To access a communications network offering a set of services, the user selects an APN on the terminal in order to set up a connection with the corresponding communications network.

Once an APN has been selected on the terminal, an
20 access protocol is initialized. In a GPRS or UMTS network, this protocol is the packet data protocol (PDP). A procedure is executed to set up a connection from the terminal to the GGSN. To enable the connection to be set up, a link across the mobile network to the selected
25 communications network is created. In a GPRS or UMTS network, that link is called a PDP context. It enables the terminal to access the services of the communications network.

At the end of the set-up procedure, the terminal
30 receives from the communications network to which a connection has been set up an address that identifies the terminal within the communications network and is associated with the PDP context linking the terminal and the communications network.

35 The ETSI standard provides for a plurality of connections to be set up simultaneously from the same terminal to different communications networks. The

document FR 02 07457 describes the use of a dedicated architecture manager in a terminal to manage simultaneous access to a plurality of communications networks.

5 In that document, on establishing a connection to a communications network, the dedicated architecture manager dialogues with the communications network. In the terminal, the dedicated architecture manager designates an architecture dedicated to the connection to the connected communications network. On setting up each
10 new connection to a new communications network, the dedicated architecture manager designates a different architecture dedicated to the connection to the new communications network. The various dedicated architectures in the same terminal operate
15 simultaneously. Each dedicated architecture is associated with a PDP context and provides access to a different communications network.

The above document mentions that each dedicated architecture comprises a network interface. Each
20 communications network communicates with a dedicated architecture of the terminal via a separate network interface. The address sent by each of the communications networks is received by the dedicated architecture manager and its parameters are set via a
25 network interface. A network interface of any dedicated architecture is unrelated to any other network interface of any other dedicated architecture.

The dedicated architecture manager in a terminal assigns each dedicated architecture to a communications
30 network. The autonomy and independent operation of the dedicated architecture of the terminal guarantee confidentiality and security between communications networks by providing a "seal" between the various services connected to the terminal.

35 To maintain the independence of the various communications networks effectively, a dedicated architecture has no functions for managing the associated

PDP context created via the mobile network to enable access from the terminal to a communications network.

Moreover, because of the autonomy of the various dedicated architectures of a terminal, each dedicated
5 architecture has no view of the operation of the other dedicated architectures of the terminal.

Thus the technical problem to be solved by the subject matter of the present invention is that of proposing a system and method for making a selection from
10 an architecture dedicated to communications network in a terminal that includes a user interface and is adapted to manage the set of dedicated architectures in the said terminal.

The solution in accordance with the present
15 invention to the technical problem stated above consists in, a connection to the communications network being set up via a mobile network by means of a PDP context link to said communications network, the system comprising selection means that are suitable for controlling access
20 to a dedicated architecture manager integrated into the terminal for managing an architecture dedicated to a communications network, and for simultaneously processing the functioning of the dedicated architectures of the terminal connected to a plurality of the communications
25 networks.

The dedicated architecture manager of the terminal manages simultaneous operation of the various architectures dedicated to the various communications networks to which the terminal is connected.

30 The selection means provide access to the dedicated architecture manager, which controls one of the dedicated architectures that it manages as a function of what the user has selected.

In this way, each of the dedicated architectures of
35 the terminal communicates with only one communications network, which is associated with the corresponding PDP context, even if the terminal is connected to a plurality

of communications networks.

The separate and autonomous operation of the various dedicated architectures of the terminal is therefore preserved, which guarantees confidentiality and security
5 between the various communications networks to which the terminal is connected. These imperatives are particularly important during a banking transaction or on connecting to a business private network, for example.

According to the invention, the selection means are
10 integrated into the user interface of the terminal.

Access to the services corresponding to a communications network is provided by the user interface of the terminal, for example display means, sound or voice means, or Braille means.

15 The user of the terminal activates the selection means to control the dedicated architecture manager.

The selection means are of any form and any kind adapted to the existing technologies of the user interface of the terminal, such as buttons on a keypad of
20 the terminal, pull-down menus, voice commands, Braille commands, hypertext links on a screen of the terminal, or any other selection device.

According to the invention, the selection means are associated with a control device for the selection means.

25 The selection means of the terminal may be activated by control devices such as temperature sensors, pressure sensors or any other control means.

The invention also consists in a method of making a selection in a terminal from an architecture dedicated to communications network, said terminal including a user
30 interface, which method is noteworthy in that, a connection to the communications network being set up via a mobile network by means of a PDP context link to said communications network, the method comprises the steps
35 of:

- integrating selection means with the user interface of the terminal;

- activating the selection means of the terminal;
- using the selection means to control access to a dedicated architecture manager integrated into the terminal to manage a state of a dedicated architecture;
- 5 - using the dedicated architecture manager to control first means for transmitting to the dedicated architecture of the terminal;
- using the dedicated architecture manager to control second means for transmitting to a communications
- 10 network;
- using the dedicated architecture manager to control a state of the PDP context link to the communications network; and
- using the dedicated architecture manager to access
- 15 a resource of the terminal accessible by the dedicated architecture.

The dedicated architecture manager assigns a dedicated architecture to each of the communications networks, offering the possibility of simultaneous but

20 different and independent management.

The selection means are used to activate the dedicated architecture manager of the terminal, which then controls access and also controls the functions of each of the dedicated architectures (by means of first

25 transmission means), each of the communications networks (by means of second transmission means), each of the corresponding PDP contexts, and each of the resources of the terminal.

When activated, and according to what the user has

30 selected, the dedicated architecture manager manages one of the dedicated architectures, one of the communications networks, one of the PDP contexts corresponding to the communications network, or one of the resources of the terminal.

35 Because the dedicated architectures operate separately and autonomously, the operation of the terminal may be adapted according to the communications

network to which it is connected. For example, there may be functions on one of the communications networks that not exist on another communications network.

Moreover, because of the increased number of
5 services accessible via communications networks, the autonomy of each dedicated architecture in particular allows assignment of specific resources, for example specific applications or a specific memory space or a specific quality of service that differ from one
10 communications network to another.

The following description, which is given with reference to the appended drawing, which is provided by way of non-limiting example, explains in what the invention consists and how it may be put into practice.

15 Figure 1 is a diagram of the general architecture of a system according to the invention for selecting in a terminal an architecture dedicated to a communications network.

To facilitate the explanation of the invention, it
20 is described using the terminology of the UMTS. However, the invention applies to all communications systems using identical communications network identification techniques.

Similarly, to simplify the description, the mobile
25 telecommunications network subscriber is indicated by a terminal 10 in the form of a user equipment (UE) in Figure 1, but may be of different kinds, for example a server, a mobile communications terminal, a personal computer (PC) or a television.

30 Whichever kind of terminal 10 is used, it is connected to a public mobile network to which the user is a subscriber.

At present, if the user of the terminal 10 wishes to
access a communications network 40, 41, 42, 50, 51, 52
35 offering a set of services to which the user requires access, the user uses a radio station of the mobile network to send an APN identifying the communications

network 40, 41, 42, 50, 51, 52.

To this end the user accesses, for example via the user interface 11, a list in the dedicated architecture manager 19 of APN identifying the communications networks
5 40, 41, 42, 50, 51, 52 to which the user is a subscriber and which the user can access. The ETSI standard provides for a plurality of connections to be set up simultaneously to different communications networks from the same terminal and, among other things, the list of
10 APN enables the terminal to operate as a so-called "multi-APN" terminal.

A radio access management equipment SGSN in the mobile network receives the APN from the terminal 10 and determines which access management equipment GGSN manages
15 the APN.

The SGSN sends the APN to an APN server to which it is connected and which holds a table of the correspondences between APN and GGSN. The SGSN selects a GGSN 30, 30' which manages that APN.

20 The GGSN 30, 30' sets up a connection to the communications network 40, 41, 42, 50, 51, 52. A PDP context link to the communications network 40, 41, 42, 50, 51, 52 is set up across the mobile network and enables the terminal 10 to access the communications
25 network 40, 41, 42, 50, 51, 52.

The GGSN 30, 30' then sends the terminal 10 an address that identifies the terminal 10 in the communications network 40, 41, 42, 50, 51, 52 to which it has been connected.

30 The dedicated architecture manager 19 in the terminal 10 receives the address, assigns a dedicated architecture 15, 16, 17 to the connected communications network 40, 41, 42, 50, 51, 52, and sends the address to the dedicated architecture 15, 16, 17 that has been
35 assigned to the communications network 40, 41, 42, 50, 51, 52.

The dedicated architecture 15, 16, 17 is associated

with the PDP context that enables access from the terminal 10 to the communications network 40, 41, 42, 50, 51, 52.

5 The connection steps referred to above are repeated each time the user of the terminal 10 wishes to access a new communications network 40, 41, 42, 50, 51, 52.

 A new connection is then set up between the terminal 10 and a new communications network 40, 41, 42, 50, 51, 52. Consequently, a new PDP context link to the new
10 communications network 40, 41, 42, 50, 51, 52 is set up across the mobile network.

 The dedicated architecture manager 19 in the terminal 10 receives a new address and assigns a new dedicated architecture 15, 16, 17 to the connected new
15 communications network 40, 41, 42, 50, 51, 52. From this point onwards, the new dedicated architecture 15, 16, 17 is associated with the new PDP context enabling access from the terminal 10 to the new communications network 40, 41, 42, 50, 51, 52.

20 When each connection is set up, and each time that a communications network 40, 41, 42, 50, 51, 52 is assigned a dedicated architecture 15, 16, 17, the dedicated architecture manager 19 stores the identifier of the dedicated architecture 15, 16, 17 used in the terminal 10
25 in a list of dedicated architectures 15, 16, 17 managed by the dedicated architecture manager 19 of the terminal 10. The ETSI standard provides for a plurality of connections to be set up simultaneously to different communications networks from the same terminal and, among
30 other things, the list of dedicated architectures enables the terminal to operate as a so-called "multi-APN" terminal.

 Once the connection has been set up, the dedicated architecture accesses the user interface 11 of the
35 terminal 10. In this way, the subscriber can access a service content of the communications network 40, 41, 42, 50, 51, 52, for example a home page 12, 13.

If display of the content on the terminal 10 is not required by the communications network, the content of the communications network can be represented by any other means of the user interface 11 of the terminal 10,
5 such as a voice message reproduced by audio means.

The user interface 11 of the terminal 10, for example comprising display means, audio means, voice means or Braille means, provides access to the services corresponding to the various communications networks 40,
10 41, 42, 50, 51, 52.

Regardless of the number of connections set up, each architecture 15, 16, 17 dedicated to a communications network 40, 41, 42, 50, 51, 52 receives information from the communications network 40, 41, 42, 50, 51, 52 via
15 each PDP context link corresponding to the communications network 40, 41, 42, 50, 51, 52.

To enable it to manage the various connections, the terminal 10 is equipped with selection means 18 integrated into the user interface 11.

20 The selection means 18 are of any form and any kind adapted to the existing technologies of the user interface 11 of the terminal 10, and may comprise buttons on keypads of the terminal, pull-down menus on display means, hypertext links on the display means and selected
25 by a cursor, for example by a mouse, by touching a touch-sensitive screen or by directing the user's gaze, voice commands spoken by the subscriber of the terminal, Braille commands, or any other selection means.

The user of the terminal 10 activates the selection
30 means 18 of the terminal 10.

The selection means 18 may equally be associated with a control device of the selection means 18. In this case, the control device activates the selection means 18 of the terminal 10.

35 For example, the control device is a temperature or pressure sensor, an induction sensor or any other sensing or measuring device enabling activation of the selection

means 18, for example as a function of the value of a temperature or pressure measured by the control device threshold or a temperature or pressure threshold.

5 The selection means 18 are either general or specific to a management function of the dedicated architecture manager 19.

10 If the selection means 18 are general, they provide access to a choice of the various management functions of the dedicated architecture manager 19, for example by means of a text or voice menu listing the management functions.

15 Otherwise, the terminal 10 may include a plurality of specific selection means each corresponding to one of the management functions of the dedicated architecture manager 19.

20 The tasks of the dedicated architecture manager 19 include managing the management functions, in particular functions for creating, modifying, suspending and closing a dedicated architecture 15, 16, 17, or any other management function useful for a dedicated architecture 15, 16, 17 or for consultation of characteristic data of a dedicated architecture 15, 16, 17, for example the resources used in the terminal 10.

25 The management function of the dedicated architecture manager 19 is activated by the selection means 18 or by the selection that has been made, for example with the aid of a list of the management functions of the dedicated architecture manager 19.

30 The dedicated architecture manager 19 controls first means 20 of transmission to an architecture 15, 16, 17 dedicated to a communications network 40, 41, 42, 50, 51, 52 according to how activation was effected. The first transmission means 20 are integrated into the dedicated architecture manager 19.

35 The dedicated architecture manager 19 commands creation, modification, suspension or closure of transmission to the architecture 15, 16, 17 dedicated to

a communications network 40, 41, 42, 50, 51, 52, for example, according to the management function selected.

The dedicated architecture manager 19 controls second means 21 of transmission to a communications
5 network 40, 41, 42, 50, 51, 52 according to how activation was effected. The second transmission means 21 are also integrated into the dedicated architecture manager 19.

The dedicated architecture manager 19 controls
10 creation, modification, suspension or closure of transmission to the communications network 40, 41, 42, 50, 51, 52, for example, according to the management function selected.

The dedicated architecture manager 19 manages the
15 state of a PDP context link to the communications network 40, 41, 42, 50, 51, 52 according to how activation was effected.

The dedicated architecture manager 19 controls creation, modification, suspension or closure of the PDP
20 context link between the terminal 10 and the communications network 40, 41, 42, 50, 51, 52 according to the management function selected, for example via the mobile network.

The dedicated architecture manager 19 allows access
25 to a resource of the terminal 10 accessible by the architecture 15, 16, 17 dedicated to a communications network 40, 41, 42, 50, 51, 52 according to the type of activation effected.

The dedicated architecture manager 19 controls a
30 memory location of the terminal 10, for example, or access to a function of the central processing unit (CPU) of the terminal 10 according to the management function selected, for the purposes of the architecture 15, 16, 17 dedicated to a communications network 40, 41, 42, 50, 51,
35 52.

Consequently, according which of the management functions has been activated, the dedicated architecture

manager 19 controls the first means 20 of transmission to an architecture 15, 16, 17 dedicated to a communications network 40, 41, 42, 50, 51, 52, the second transmission means 21 to a communications network 40, 41, 42, 50, 51, 52, the PDP context linking the terminal 10 and the communications network 40, 41, 42, 50, 51, 52 or the resource of the terminal 10.

According to what selection has been effected, the dedicated architecture manager manages one of the dedicated architectures, one of the communications networks, one of the PDP contexts corresponding to the communications network or one of the resources of the terminal, and all of the above in operation and in parallel with access by the terminal 10 to the services provided by the communications networks 40, 41, 42, 50, 51, 52.

In particular, if the user of the terminal 10 wishes to access a communications network 40, 41, 42, 50, 51, 52, the user accesses the list in the dedicated architecture manager 19 of APN identifying the communications networks 40, 41, 42, 50, 51, 52 to which the user is a subscriber and which the user can access.

After the user selects from the list an APN identifying one of the communications networks 40, 41, 42, 50, 51, 52 associated with a corresponding PDP context, the creation function of the dedicated architecture manager 19, by means of the first transmission means 20, assigns the selected APN a dedicated architecture 15, 16, 17 managed by the dedicated architecture manager 19 of the terminal 10.

The creation function of the dedicated architecture manager 19 uses the second transmission means 21 to control the standard ETSI (European Telecommunications Standards Institute) PDP context activation procedure, which leads to the provision of access to the communications network 40, 41, 42, 50, 51, 52 identified by the APN selected on the terminal 10.

The dedicated architecture manager 19 of the terminal 10 controls access to a resource of the terminal 10 used by the architecture 15, 16, 17 dedicated to the communications network 40, 41, 42, 50, 51, 52, such as
5 access to a memory location of the terminal 10 or to a function of the central processor unit (CPU) of the terminal 10, for the purposes of the architecture 15, 16, 17 dedicated to the communications network 40, 41, 42, 50, 51, 52.

10 Similarly, once a connection has been set up between the terminal 10 and a communications network 40, 41, 42, 50, 51, 52, the modification function of the dedicated architecture manager 19 modifies the resources used in the terminal 10 by the architecture 15, 16, 17 dedicated
15 to the connected communications network 40, 41, 42, 50, 51, 52 associated with the corresponding PDP context.

This modification allows adaptation of the resources of the terminal 10 to the communications network 40, 41, 42, 50, 51, 52, for example, on the occasion of a change
20 of quality of service, by modifying the capacity of the memories assigned in the terminal 10.

By means of the first and second transmission means 20, 21, the modification function of the dedicated architecture manager 19 controls standard ETSI PDP
25 content modification procedure, which includes modification of the characteristics of transmission to the connected communications network 40, 41, 42, 50, 51, 52.

In the exactly the same way, once a connection has
30 been set up between the terminal 10 and a communications network 40, 41, 42, 50, 51, 52, the suspension function of the dedicated architecture manager 19 temporarily suspends transmission between the dedicated architecture manager 19 and the architecture 15, 16, 17 dedicated to
35 the connected communications network 40, 41, 42, 50, 51, 52 associated with the corresponding PDP context.

Because of this, the dedicated architecture 15, 16,

17 can no longer access the connected communications network 40, 41, 42, 50, 51, 52 and can therefore no longer carry out any function, modification or intervention of any kind, such as assigning a memory resource of the terminal 10 or modifying the transmission quality of service.

By means of the first and second transmission means 20, 21, the suspension function of the dedicated architecture manager 19 controls the standard ETSI suspend procedure, which leads to temporary stopping of transmission to the connected communications network 40, 41, 42, 50, 51, 52.

Lifting a suspension leads to the resumption of normal transmission at the point and in the state at which transmission was suspended. In the dedicated architecture manager 19, the lifting of the suspension enables control of the standard ETSI resume procedure, which leads to the resumption of transmission to the connected communications network 40, 41, 42, 50, 51, 52.

In the same way, once a connection has been set up between the terminal 10 and a communications network 40, 41, 42, 50, 51, 52, the closure function of the dedicated architecture manager 19 closes down all transmission between the dedicated architecture manager 19 and the architecture 15, 16, 17 dedicated to the connected communications network 40, 41, 42, 50, 51, 52 associated with the corresponding PDP context.

By means of the first and second transmission means 20, 21, the closure function of the dedicated architecture manager 19 controls the standard ETSI PDP context deactivation procedure, which leads to the stopping of all transmission to the communications network 40, 41, 42, 50, 51, 52 connected to the terminal 10.

The dedicated architecture manager 19 of the terminal 10 controls the closure of the architecture 15, 16, 17 dedicated to the connected communications network,

which releases all resources used in the terminal 10 by the dedicated architecture 15, 16, 17, for example all the memory locations of the terminal 10 or access to the central processor unit (CPU) of the terminal for the purposes of the dedicated architecture 15, 16, 17. Any files downloaded and stored in a non-volatile memory of the terminal 10 are not affected by the closure function and the releasing of the other resources of the terminal 10.

At the end of execution of the closure function, the identifier of the closed dedicated architecture 15, 16, 17 is deleted from the list of dedicated architectures 15, 16, 17 managed by the dedicated architecture manager 19 of the terminal 10.

15